

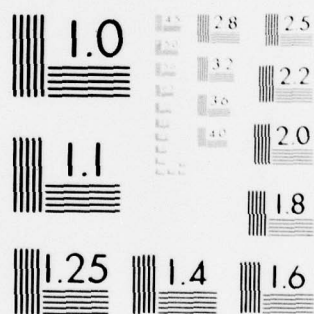
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ADVISORY GROUP FOR AEROSPACE RESEARCH & DEVELOPMENT

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THE MISSION OF AGARD

The mission of AGARD is to bring together the leading personalities of the NATO nations in the fields of science and technology relating to aerospace for the following purposes:

- Exchanging of scientific and technical information;
- Continuously stimulating advances in the aerospace sciences relevant to strengthening the common defence posture;
- Improving the co-operation among member nations in aerospace research and development;
- Providing scientific and technical advice and assistance to the North Atlantic Military Committee in the field of aerospace research and development;
- Rendering scientific and technical assistance, as requested, to other NATO bodies and to member nations in connection with research and development problems in the aerospace field;
- Providing assistance to member nations for the purpose of increasing their scientific and technical potential;
- Recommending effective ways for the member nations to use their research and development capabilities for the common benefit of the NATO community.

The highest authority within AGARD is the National Delegates Board consisting of officially appointed senior representatives from each member nation. The mission of AGARD is carried out through the Panels which are composed of experts appointed by the National Delegates, the Consultant and Exchange Programme and the Aerospace Applications Studies Programme. The results of AGARD work are reported to the member nations and the NATO Authorities through the AGARD series of publications of which this is one.

Participation in AGARD activities is by invitation only and is normally limited to citizens of the NATO nations.

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PREFACE

This Bulletin presents the 1980 programme approved by the AGARD National Delegates Board. Section I includes a chronological listing of the meetings tentatively scheduled to take place during 1980 and Section II gives a detailed description of the individual Panel Programmes, the Consultant and Exchange Programme, and the Military Committee Studies Programme. The total budget required to support the Proposed 1980 AGARD Technical Programme is presented in Section III. The Publication Summary in Section IV identifies by activity the AGARD publications scheduled for initiation and/or publication in 1980.

Jack Burnham
Jack Burnham
Director

⑥ AGARD Bulletin. Technical Programme.
1980.

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CONTENTS

	Page
PREFACE	1
I – CALENDAR OF PLANNED MEETINGS – 1980	3
Traduction des Titres des Réunions	7
II – PROGRAMME DESCRIPTIONS	9
PANELS	
Aerospace Medical	10
Avionics	12
Electromagnetic Wave Propagation	13
Flight Mechanics	14
Fluid Dynamics	16
Guidance and Control	18
Propulsion and Energetics	20
Structures and Materials	22
Technical Information	24
CONSULTANT AND EXCHANGE PROGRAMME	
Individual Consultants	25
Lecture Series	25
MILITARY COMMITTEE STUDIES	28
HEADQUARTERS	29
III – BUDGET SUMMARY	30
IV – PUBLICATIONS SUMMARY	31

I - CALENDAR OF PLANNED MEETINGS - 1980

Traduction des Titres des Réunions

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CALENDAR OF PLANNED MEETINGS 1980

<i>Tentative Dates</i>	<i>Location</i>	<i>Panel</i>	<i>Type of Meeting/Subject</i>
19-21 March	FRANCE (Paris)	Headquarters	48th National Delegates Board Meeting 28th Panel Chairmen Meeting 10th National Coordinators Meeting 29th Steering Committee Meeting
27-28 March	PORTUGAL (Lisbon)	Structures & Materials	Lecture Series No.106 Materials Coating Techniques
31 March-1 April	GREECE (Athens)	Structures & Materials	Lecture Series No.106 Materials Coating Techniques
3-4 April	TURKEY (Ankara)	Structures & Materials	Lecture Series No.106 Materials Coating Techniques
13-18 April	GREECE (Athens)	Structures & Materials	50th Panel Meeting/Specialists' Meeting Effect of Service Environment on Composite Materials
5-9 May	GERMANY (Neubiberg)	Fluid Dynamics	46th Panel Meeting/Symposium on Subsonic-Transonic Configuration Aerodynamics
5-9 May	UNITED STATES (Eglin AFB, Fa)	Guidance & Control	30th Panel Meeting/Symposium on Guidance and Control Aspects of Tactical Air-Launched Missiles (NATO-Secret)
5-9 May	BELGIUM (Brussels)	Propulsion & Energetics	55th Panel Meeting/Specialists' Meeting on a) Testing and Measurement Techniques in Heat Transfer and Combustion b) Centrifugal Compressors
12-16 May	UNITED KINGDOM (London)	Electromagnetic Wave Propagation	Symposium on Propagation Effects in Space/Earth Paths
12-13 May	FRANCE/GERMANY (St Louis)	Propulsion & Energetics	Lecture Series No.107 The Application of Design to Cost and Life Cycle Cost to Aircraft Engines
15-16 May	UNITED KINGDOM (London)	Propulsion & Energetics	Lecture Series No.107 The Application of Design to Cost and Life Cycle Cost to Aircraft Engines
19-21 May	FRANCE (Paris)	Aerospace Applications Studies Committee	Meeting No.18 - Refining of Final Terms of Reference for AAS 13, 14 & 15 - Organization of Working Group for AAS 13 - Initial Review for Study Group 12
19-23 May	NETHERLANDS (Amsterdam)	Flight Mechanics	56th Panel Meeting/Symposium on Design to Cost and Life Cycle Cost
19-23 May	NORWAY (Bodø)	Aerospace Medical	Specialists' Meeting on a) Aircrew Safety and Survivability b) Disorientation in Flight
19-23 May	BELGIUM (VKI, Brussels)	Fluid Dynamics	Lecture Series No.111 Cryogenic Wind Tunnels
27-29 May	UNITED STATES (NASA, Langley)	Fluid Dynamics	Lecture Series No.111 Cryogenic Wind Tunnels

<i>Tentative Dates</i>	<i>Location</i>	<i>Panel</i>	<i>Type of Meeting/Subject</i>
5-6 June	NORWAY (Stanern)	Flight Mechanics	Lecture Series No.108 Aircraft Assessment and Acceptance Testing
9-10 June	GREECE (Athens)	Flight Mechanics	Lecture Series No.108 Aircraft Assessment and Acceptance Testing
9-10 June	UNITED KINGDOM (London)	Avionics	Lecture Series No.110 Atmospheric Electricity/Aircraft Interaction
12-13 June	GERMANY (Munich)	Avionics	Lecture Series No.110 Atmospheric Electricity/Aircraft Interaction
12-13 June	TURKEY (Ankara)	Flight Mechanics	Lecture Series No.108 Aircraft Assessment and Acceptance Testing
16-20 June	PORTUGAL (Lisbon)	Avionics	39th Panel Meeting/Specialists' Meeting on Electromagnetic Effects of Carbon Composite Materials upon Avionics Systems
24-25 June	UNITED STATES (Palo Alto, Ca)	Avionics	Lecture Series No.110 Atmospheric Electricity/Aircraft Interaction
8-12 September	DENMARK (Copenhagen)	Avionics	40th Panel Meeting/Symposium on Image and Sensor Data Processing for Target Acquisition and Recognition (NATO-Secret)
15-19 September	CANADA (Toronto)	Aerospace Medical	37th Panel Meeting/Specialists' Meeting on a) Long-Term Therapeutics and Prophylactic Measures for Aircrew b) Toxic Hazards in Aviation
14-19 September	FRANCE (Aix en Provence)	Structures & Materials	51st Panel Meeting/Specialists' Meeting on a) Fatigue of Helicopters b) Boundary-Layer Effects on Unsteady Airloads
24-26 September	NETHERLANDS (The Hague)	Headquarters	16th Annual Meeting 49th National Delegates Board Meeting 29th Panel Chairmen Meeting
29 September - 3 October	UNITED STATES (Colorado Springs)	Fluid Dynamics	47th Panel Meeting/Symposium on Computation of Viscous-Inviscid Interactions
29 September - 3 October	ITALY (Turin)	Propulsion & Energetics	56th Panel Meeting/Symposium on Turbine Engine Testing
6-7 October	UNITED KINGDOM (London)	Guidance & Control	Lecture Series No.109 Fault Tolerance Design and Redundancy - Management Techniques
9-10 October	ITALY (Rome)	Guidance & Control	Lecture Series No.109 Fault Tolerance Design and Redundancy - Management Techniques
13-14 October	GREECE (Athens)	Guidance & Control	Lecture Series No.109 Fault Tolerance Design and Redundancy - Management Techniques
13-17 October	UNITED KINGDOM (London)	Guidance & Control	31st Panel Meeting/Symposium on Precision Positioning and Inertial Guidance Sensors; Technology and Operational Aspects (NATO-Confidential)

<i>Tentative Dates</i>	<i>Location</i>	<i>Panel</i>	<i>Type of Meeting/Subject</i>
13-14 October	GERMANY (Munich)	Technical Information	Lecture Series No.112 Patents - An Information Resource
16-17 October	NETHERLANDS (Delft)	Technical Information	Lecture Series No.112 Patents - An Information Resource
27-31 October	NORWAY (Geilo)	Flight Mechanics	57th Panel Meeting/Symposium on Subsystem Testing/Flight Test Instrumentation
27-31 October	ITALY (Naples)	Electromagnetic Wave Propagation	27th Panel Meeting/Symposium on Physical Basis of the Ionosphere in the Solar Terrestrial System
3-7 November	PORTUGAL (Lisbon)	Technical Information	33rd Panel Meeting/Specialists' Meeting on Information Services: Their Organization, Control and Use
12-14 November	BELGIUM (Brussels)	Aerospace Applications Studies Committee	Meeting No.19 - Review of Terms of Reference for Proposed AA Studies - Organization of Working Group for AAS 14 - Final Review for Study Group 12 - Initial Review for Study Group 13 (NATO-Secret)

TRADUCTION DES TITRES DES REUNIONS

Titles of Meetings

Titres des Réunions

Aerospace Medical Panel

- | | |
|--|--|
| – Aircrew Safety and Survivability | – La Sécurité et les Chances de Survie des Equipages Navigants |
| – Disorientation in Flight | – La Désorientation en Vol |
| – Long-Term Therapeutics and Prophylactic Measures for Aircrew | – Thérapeutique à Long Terme et Mesures Prophylactiques pour les Equipages Navigants |
| – Toxic Hazards in Aviation | – Les Dangers de Toxicité en Aviation |

Avionics Panel

- | | |
|---|---|
| – Electromagnetic Effects of Carbon Composite Materials upon Avionics Systems | – Les Effets Electromagnétiques des Matériaux Composites Contenant du Carbone sur les Systèmes Electroniques Aérospatiaux |
| – Image and Sensor Data Processing for Target Acquisition and Recognition | – Traitement des Images et des Données fournies par les Senseurs pour l'Acquisition et la Reconnaissance des Cibles |

Electromagnetic Wave Propagation Panel

- | | |
|--|---|
| – Propagation Effects in Space/Earth Paths | – La Base Physique des Effets de Propagation le long des Trajectoires Spatiales et Terrestres |
| – Physical Basis of the Ionosphere | – La Base Physique de l'Ionosphère |

Flight Mechanics Panel

- | | |
|---|--|
| – Design to Cost and Life Cycle Cost | – La Conception Economique et le Coût Total (LCC) |
| – Subsystem Testing/Flight Test Instrumentation | – Instrumentation d'Essais de Sous-Systèmes et d'Essais en Vol |

Fluid Dynamics Panel

- | | |
|---|--|
| – Subsonic-Transonic Configuration Aerodynamics | – L'Aérodynamique des Configurations Subsoniques-Transsoniques |
| – Computation of Viscous-Inviscid Interactions | – Les Interactions entre Ecoulements Visqueux et Non Visqueux |

Guidance and Control Panel

- | | |
|---|--|
| – Guidance and Control Aspects of Tactical Air-Launched Missiles | – Les Aspects de Guidage et Contrôle des Missiles Tactiques Aéroportés |
| – Precision Positioning and Inertial Guidance Sensors: Technology and Operational Aspects | – Technologie des Systèmes de Guidage Inertiel et des Systèmes de Détermination Precise de Position – Techniques de Filtrage – Etat Actuel et Développements Opérationnels |

Propulsion and Energetics Panel

- | | |
|--|---|
| – Testing and Measurement Techniques in Heat Transfer and Combustion | – Les Techniques d'Essais et de Mesures dans les Transferts Thermiques et la Combustion |
| – Centrifugal Compressors | – Les Compresseurs Centrifuges |
| – Turbine Engine Testing | – Les Essais de Turbomoteurs |

*Titles of Meetings**Titres des Réunions***Structures and Materials Panel**

- | | |
|---|---|
| <ul style="list-style-type: none"> — Effect of Service Environment on Composite Materials — Boundary-Layer Effects on Unsteady Airloads — Fatigue of Helicopters | <ul style="list-style-type: none"> — L'influence du Milieu Opérationnel sur les Matériaux Composites — Les Effets de la Couche Limite sur les Charges Aérodynamiques Instables — La Fatigue des Hélicoptères |
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Technical Information Panel

- | | |
|---|--|
| <ul style="list-style-type: none"> — Information Services: Their Organization, Control and Use | <ul style="list-style-type: none"> — Les Services d'Information: leur Organisation, leur Contrôle et leur Utilisation |
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Lecture Series

- | | |
|---|---|
| <ul style="list-style-type: none"> — Materials Coating Techniques — The Application of Design to Cost and Life Cycle Cost to Aircraft Engines — Cryogenic Wind Tunnels — Aircraft Assessment and Acceptance Testing — Atmospheric Electricity/Aircraft Interaction — Fault Tolerance Design and Redundancy Management Techniques — Patents — An Information Resource | <ul style="list-style-type: none"> — Les Techniques d'Enrobage de Matériaux — La Méthodologie de la Conception Economique des Moteurs d'Avions — Les Souffleries Cryogènes — Essais d'Evaluation et de Réception des Avions — Interactions entre Electricité Atmosphérique et Aéronefs — Conception Axée sur la Tolerance aux Defectuosités et Redondance — Techniques d'Exploitation — Les Brevets en tant que Réserve d'Informations |
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Aerospace Applications Studies Committee

- | | |
|--|--|
| <ul style="list-style-type: none"> — AASC Meetings and Working Groups | <ul style="list-style-type: none"> — Réunions de l'AASC et Groupes de Travail |
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Project 2000

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| <ul style="list-style-type: none"> — Review Board Meetings | <ul style="list-style-type: none"> — Réunions du Comité Directeur |
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Headquarters

- | | |
|---|---|
| <ul style="list-style-type: none"> — AGARD Annual Meeting — National Delegates Board Meetings — Steering Committee Meeting — Panel Chairmen Meetings — National Coordinators Meeting | <ul style="list-style-type: none"> — Réunion Annuelle de l'AGARD — Réunions du Conseil des Délégués Nationaux — Réunion du Comité d'Orientation — Réunions des Présidents de Panels — Réunion des Coordonnateurs Nationaux |
|---|---|

II - PROGRAMME DESCRIPTIONS

PANELS

CONSULTANT & EXCHANGE PROGRAMME

- INDIVIDUAL CONSULTANTS
- LECTURE SERIES

MILITARY COMMITTEE STUDIES

HEADQUARTERS

AEROSPACE MEDICAL PANEL

Chairman: Dr B.O. HARTMAN, USAF
 Deputy Chairman: Col Méd. J. BANDE, BAF
 Executive: Lt Col F. MONESI, IAF

PROGRAMME

In 1980, the Panel will cover four specialists' topics in the course of its Spring and Fall Meetings.

In the Spring Meeting, the first session will be devoted to the topic of 'Aircrew Safety and Survivability (Limited to Combat Aircraft)', dealing with accident analysis, fatigue, safety and survival equipment and other aircrew factors affecting safety and survivability. For the second session, the topic 'Spatial Disorientation in Flight: Current Problems' has been taken up to provide a useful review of recent work on this subject.

The Fall Meeting will cover in the first session the topic 'Long-Term Therapeutics and Prophylactic Measures for Aircrew' designed to highlight and discuss several of the questions with which all air force medical services are concerned.

In the second session, the subject of 'Toxic Hazards in Aviation' will cover the identification, quantification and estimation as to magnitude of toxic hazards associated with aircraft operations.

In addition, the Panel will organize the 6th Advanced Operational Aviation Medicine Course on 'Cardiology in Aircrew'.

The Panel will publish Conference Preprints and Conference Proceedings for the four topics of the specialists' meetings, the Advisory Report of the Working Group on 'Fidelity of Flight Simulation for Pilot Training', the Report of the above-mentioned 6th Advanced Operational Aviation Medicine Course on 'Cardiology in Aircrew', two AGARDographs, each in both English and French, and one Handbook.

MEETINGS

Specialists' Meeting	— Aircrew Safety and Survivability (Limited to Combat Aircraft) — Spatial Disorientation in Flight: Current Problems	19–23 May 1980 Norway
37th Panel Meeting/ Specialists' Meeting	— Long-Term Therapeutics and Prophylactic Measures for Aircrew — Toxic Hazards in Aviation	15–19 September 1980 Canada

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Aircrew Safety and Survivability (Limited to Combat Aircraft) Conference Preprints	April 1980
Aircrew Safety and Survivability (Limited to Combat Aircraft) Conference Proceedings (including a Technical Evaluation Report)	August 1980
Spatial Disorientation in Flight Conference Preprints	April 1980
Spatial Disorientation in Flight Conference Proceedings (including a Technical Evaluation Report)	August 1980
Long-Term Therapeutics and Prophylactic Measures for Aircrew Conference Preprints	August 1980

<i>Subject</i>	<i>Projected Publication Date</i>
Long-Term Therapeutics and Prophylactic Measures for Aircrew Conference Proceedings (including a Technical Evaluation Report)	December 1980
Toxic Hazards in Aviation Conference Preprints	August 1980
Toxic Hazards in Aviation Conference Proceedings (including a Technical Evaluation Report)	December 1980
Non-Invasive Techniques for Cardiovascular Investigation AGARDograph (English and French Versions)	December 1980
Sensorial Functions in High Altitude and Space AGARDograph (English and French Versions)	December 1980
6th Advanced Operational Aviation Medicine Course on Cardiology in Aircrew Report	July 1980
Sleep, Sleep Disturbance and Aircrew Handbook	December 1980
Fidelity of Flight Simulation for Pilot Training Advisory Report	January 1981*

* Approved for printing dependent upon availability of resources.

AVIONICS PANEL

Chairman: Ir H.A.T. TIMMERS, Netherlands
Deputy Chairman: Dr Ing. M. VOGEL, Germany
Executive: Lt Col J.B. CATILLER, USAF

PROGRAMME

The 1980 Avionics Panel programme will include one Symposium, one Specialists' Meeting and sponsorship of one Lecture Series.

The Spring Specialists' Meeting will be entitled 'Electromagnetic Effects of Carbon Composite Materials upon Avionics Systems'. Recent advances in the development of carbon fibre composite materials have encouraged aircraft designers and manufacturers to introduce these materials into aircraft structures. The electromagnetic effects are difficult to measure and the overall economics and performances are hard to judge without in-depth study. This meeting will provide a very useful data exchange within NATO.

The Fall Symposium will be entitled 'Image Sensor Data Processing for Target Acquisition and Recognition'. The rapidly developing technologies in image-processing techniques are impacting a broad area of military radar and optical systems including surveillance, low-altitude attack systems and autonomous terminal homing weapons. The emphasis of this meeting is on those image processing or signal processing techniques which either enhance the ability of an operator to perform target acquisition and recognition or allow the automatic performance of these functions.

The Lecture Series sponsored by the Panel will provide analysis of vulnerability of aircraft to atmospheric electricity hazards, an increasing threat to future aircraft due to the use of more sensitive solid-state electronics and microprocessors and the integration of non-metallic materials into the aircraft structure. The latter, of course, reduces electromagnetic shielding and leads to potential problems due to surface charges. The series is closely related to the Spring Specialists' Meeting.

MEETINGS

39th Panel Meeting/ Specialists' Meeting	Electromagnetic Effects of Carbon Composite Materials upon Avionics Systems	16 - 20 June 1980 Portugal
40th Panel Meeting/ Symposium (Classified)	Image Sensor Data Processing for Target Acquisition and Recognition	8-12 September 1980 Denmark

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Electromagnetic Effects of Carbon Composite Materials upon Avionics Systems Conference Preprints	May 1980
Electromagnetic Effects of Carbon Composite Materials upon Avionics Systems Conference Proceedings	November 1980
Image Sensor Data Processing for Target Acquisition and Recognition Conference Preprints	August 1980
Image Sensor Data Processing for Target Acquisition and Recognition Conference Proceedings	December 1980

ELECTROMAGNETIC WAVE PROPAGATION PANEL

Chairman: Dr H.J.ALBRECHT, Germany
Deputy Chairman: Dr J.AARONS, US
Executive: Lt Col J.B.CATILLER, USAF

PROGRAMME

The 1980 Electromagnetic Wave Propagation Panel programme will consist of two Symposia.

The Spring Symposium will be entitled 'Propagation Effects in Space/Earth Paths'. For two decades, communications using a relay station in space have been used as an extremely effective supplement to more orthodox means of transmitting information. Satellites have also been employed for remote sensing and other related tasks. An enormous amount of data has been collected. Together with theoretical work, the evaluation of such data has resulted in an adequate basis for system-oriented planning. The present state-of-the-art requires a scientific meeting to deal with the entire field of propagation influence upon space/earth paths.

The Fall Symposium will be entitled: 'The Physical Basis of the Ionosphere in the Solar Terrestrial System'. Ionospheric models are important for a number of purposes. When using the ionosphere for communications it is clear that frequencies, look-angles and fading rates must be estimated and their short and long-term variations clearly understood. Ionospheric data are now available for several solar cycles and a wealth of information is being developed concerning the sun, interplanetary medium, magnetosphere and atmosphere. This meeting will enhance our understanding of the ionosphere by considering it in the context of the solar-terrestrial system.

MEETINGS

Symposium	— Propagation Effects in Space/Earth Paths	12–16 May 1980 United Kingdom
27th Panel Meeting	— The Physical Basis of the Ionosphere in the Solar Terrestrial System	27–31 October 1980 Italy

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Propagation Effects in Space/Earth Paths Conference Preprints	April 1980
Propagation Effects in Space/Earth Paths Conference Proceedings	October 1980
The Physical Basis of the Ionosphere in the Solar Terrestrial System Conference Preprints	October 1980
The Physical Basis of the Ionosphere in the Solar Terrestrial System Conference Proceedings	February 1981

FLIGHT MECHANICS PANEL

Chairman: M. l'Ingénieur J.F. RENAUDIE, France
Deputy Chairman: Mr R.J. BALMER, UK
Executive: Mr T. WILCOCK, UK

PROGRAMME

In 1980 the Flight Mechanics Panel will hold two Symposia and sponsor a Lecture Series.

The first Symposium will be on the subject of 'Design to Cost and Life Cycle Cost'.

In all of the NATO countries, there is tremendous pressure for cost reduction and tendencies for other priorities to take available funding from military defence and preparedness. At the same time, the costs of developing, acquiring and operating modern weapon systems have been escalating. As a result, more and more military procurement contracts in the USA and Europe include specific provisions requiring the application of new design economics procedures to assure minimum total cost of ownership from development through the life of the system. These new concepts include design to cost (DTC) which is concerned with minimizing the cost of acquisition of a weapon system and life cycle costing (LCC) which is concerned with the total cost of ownership of a system; that is, acquisition plus operation and support costs. The objective of this symposium is to provide a forum in which those who are currently specifying, developing, and applying these new design philosophies can review and exchange information on how problems are defined, what techniques are being tried, and which ones seem to be working. The meeting will address the current concepts for resolving the conflicts between the traditional performance-oriented design team and the 'balanced' design team which incorporates reliability, maintainability and cost specialists within the design/engineering organization.

The meeting will be in four sessions covering the impact on system design of cost analysis of: specifications and requirements, development and production, operations and support and subsystems and components. The first session will include such subjects as: examples of cost saving due to relaxation in specification requirements and the problems raised by overspecification; the need to identify cost drivers in the specifications; and the possible gains which could be expected from changing our strategy to the development of long life, fuel conserving training systems, with relaxed vulnerability requirements, plus short-life war machines. The second session will review what techniques are available for analysing the cost effectiveness of introducing new technology, despite not having a data base from which to project operating costs, and will seek to present examples of cost savings due to improvements in design, materials, and manufacture. Session three will examine the trade-offs between technical performance and reliability. With operation and support costs ever rising (at present they constitute about two-thirds of the life cycle costs) there is a growing need to improve operational reliability and maintainability while simultaneously providing the necessary performance. Design decisions that impact these areas and methods of demonstrating their effectiveness will be discussed; examples of the relative costs of acquisition and ownership will be sought. The final session will look at the cost drivers of subsystems and components. To the present most of the analyses of LCC have been concerned with engines and avionics, and as it is also easier to deal with discrete packages such as these, rather than with the complete aircraft, the session will concentrate on reviewing the progress in these fields. The Symposium will end with a Round Table Discussion.

The second Symposium will be on 'Subsystem Testing/Flight Test Instrumentation'.

During the Panel's last meeting on Flight Test Techniques, in 1976, it was noted that little attention had been given to these subjects, primarily because of the lack of time. The proposed Symposium will, in effect, be two Specialists' Meetings with a linking session of interest to both groups of people. The first session will deal specifically with subsystem testing techniques. The impact of climatic conditions and special instrumentation techniques will be included, as will the role of the test pilot in test preparation and conduct. The second session will concentrate on instrumentation techniques and will serve as the link between the two specialisations. New instrumentation system concepts and instrumentation techniques peculiar to subsystem testing will be emphasised. The final session will be aimed at presenting airborne instrumentation systems and application techniques.

The Lecture Series on 'Aircraft Assessment and Acceptance Testing' is intended to cover the basic requirements and techniques for the assessment/acceptance testing of production aircraft and airborne systems. It will be aimed primarily at those countries which do not have largescale sophisticated test facilities.

The Panel will be involved in four working groups. Those on 'Rotorcraft Icing' and 'Characteristics of Flight Simulator Visual Systems' were initiated this year, while that on 'The Fidelity of Flight Simulation for Pilot Training', an AMP-led activity, will complete its work. Finally, the 'Flight Test Instrumentation' working group will work towards completion of the final Volumes of the AGARDograph No.160 series and continue to update the Manual on Flight Test Techniques.

MEETINGS

56th Panel Meeting/ — Design to Cost and Life Cycle Cost
Symposium

19-23 May 1980
Netherlands

57th Panel Meeting/ — Subsystem Testing Flight Test Instrumentation
Symposium

27-31 October 1980
Norway

PUBLICATIONS

<i>Subject</i>	<i>Proposed Publication Date</i>
The Use of Computers as a Design Tool Conference Proceedings	January 1980
The Use of Computers as a Design Tool Technical Evaluation Report	January 1980
Design to Cost and Life Cycle Cost Conference Proceedings	September 1980
Design to Cost and Life Cycle Cost Technical Evaluation Report	September 1980
Flight Test Instrumentation and Test Techniques Volumes AGARDographs	1980

FLUID DYNAMICS PANEL

Chairman: Mr J. L. JONES, US
Deputy Chairman: Dr K. J. ORLIK-RÜCKEMANN, Canada
Executive: Mr R. H. ROLLINS II, US

PROGRAMME

The Fluid Dynamics Panel 1980 Programme will consist of two Symposia, sponsorship of a Lecture Series, Special Course and Working Group, and publication of several AGARDographs and Reports.

The Spring 1980 Symposium will be on the subject of 'Subsonic-Transonic Configuration Aerodynamics'. The requirement of improved performance of military combat and airlift aircraft requires not only highly refined point designs at specific flight conditions, but also mission design to maintain optimal performance over the flight spectrum; for instance, by variable geometry concepts. Of particular importance is the subsonic and transonic aerodynamic design of the wing, fuselage, components of the empennage, external and conformal stores, fuselage and wing-mounted nacelle-pylons with their powered jet exhausts; such that each component achieves optimal performance under the influence of the other components. Not only must adverse interference effects be eliminated, but positive favorable interference must be sought. There have been great strides recently in the understanding of aerodynamic interference through more carefully conducted and highly diagnosed windtunnel tests, as well as by the availability of versatile computer codes and powerful computers. It will be the aim of the Symposium to report on these accomplishments.

Contributions on the following topics are being solicited for the Spring Symposium: Experimental Results that address important interference effects such as nacelle-pylon, powered jet, external stores, wing interference; empennage aerodynamics including optimal design in the presence of the wing and jet exhaust disturbances; nonplanar wing configurations (winglets, severe wing twists due to aeroelastic tailoring); canard-wing interference; and strake-fin interference. Theoretical or numerical methods capable of treating complex configurations with reasonable computing times; *approximate means to incorporate the viscous interactions and powered jets and comparisons with experiments*; and applications to configuration optimization.

In the Fall, a Symposium on 'Computation of Viscous-Inviscid Interactions' will be held. The Symposium will focus on methods for computing viscous-inviscid interactions in the subsonic-transonic speed regimes. A variety of unresolved aerodynamic problems confronting aircraft design engineers include this interaction. While the Navier-Stokes equations are capable of describing the complex flows, their extensive computation time and other problems presently restrict their utility. With widespread use of these equations still some time in the future, designers continue to rely on other procedures which explicitly match viscous layers to external flow.

Topics for discussion at the Fall Symposium include methods for calculating overall flowfields and treatments of localized phenomena. Methodology for two- and three-dimensional attached flows, flow with separation, and unsteady flow will be presented. Transition, shock boundary-layer interactions, trailing-edge flows and vortices and vortex sheets are also within the scope of the Symposium.

The Panel will also sponsor a Lecture Series on Cryogenic Windtunnels, with emphasis on unfamiliar facets of technology which must be applied and on solutions to special problems such as model construction, real gas effects, instrumentation design, and tunnel operational procedures.

In addition, a Special Course will be presented on Unsteady Aerodynamics. The aim of the course will be to present the fundamental character of unsteady flows, to outline the contexts in which unsteady aerodynamics are required for design, to survey the state-of-art of current prediction methods, and to describe contemporary experimental techniques and apparatus.

The Working Group on 'Fluid Dynamic Aspects of Internal Ballistics' will conduct a workshop on 'Theory and Modeling of Fluid Dynamic Aspects of Interior Ballistics of Guns' and complete its report during the year.

The Subcommittee on Windtunnel Testing Techniques will convene the first of a series of small seminars amongst experts in the areas of Transonic Test Sections, Cryogenic Testing Technology, Integration of Computing and Windtunnel Testing, and Required Flow Quality and Data Accuracy. The meetings will result in recommendations to the Panel and to AGARD in these fields.

MEETINGS

46th Panel Meeting/ Symposium	– Subsonic-Transonic Configuration Aerodynamics	5–9 May 1980 Munich, Germany
47th Panel Meeting/ Symposium	– Computation of Viscous-Inviscid Interactions	29 September – 3 October 1980 Colorado Springs, USA

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Turbulent Boundary-Layers – Experiments, Theory and Modelling Conference Proceedings	January 1980
Unsteady Aerodynamics (Special Course Proceedings) Report	February 1980
Subsonic-Transonic Configuration Aerodynamics Conference Preprints	April 1980
Compilation of Compressible Turbulent Boundary-Layer Data AGARDograph	May 1980
Subsonic-Transonic Configuration Aerodynamics Conference Proceedings	August 1980
Computation of Viscous-Inviscid Interactions Conference Preprints	September 1980
Subsonic-Transonic Configuration Aerodynamics Technical Evaluation Report (Advisory Report)	September 1980
Aircraft Drag due to Roughness, Excessences and Protuberances AGARDograph	December 1980
A Compilation of Unsteady Turbulent Boundary-Layer Data AGARDograph	December 1980
Recent Developments in Computational Transonic Methods AGARDograph	1981
Models of the Lower Atmosphere AGARDograph	1981
Fluid Dynamic Aspects of Internal Ballistics Report of Working Group 05 (Advisory Report)	1981

GUIDANCE AND CONTROL PANEL

Chairman: Mr P. KANT, Netherlands
Deputy Chairman: Mr G. C. HOWELL, UK
Executive: Colonel J. C. de CHASSEY, EAF

PROGRAMME

The Guidance and Control Panel 1980 programme will consist mainly of two Symposia and two AGARDographs. The Panel will also initiate a new Working Group and sponsor a Lecture Series.

The Spring Symposium will be devoted to the 'Guidance and Control Aspects of Tactical Air-Launched Missiles' (Classified). The Panel's last comprehensive treatment of the subject was in 1973 when the 16th Symposium on Precision Weapon Delivery Systems was held at Eglin Air Force Base, USA. Many important advances in guidance sensor technology have taken place since that time and ample material of considerable interest to the guidance and control community could be presented. This area is of vital concern to NATO and a symposium on the subject would be an invaluable contribution.

The Fall Symposium will deal with 'Precision Positioning and Inertial Guidance Sensors: Technology and Operational Aspects' (Classified). One of the most significant new developments in guidance and control systems and technology is the new class of precision position determination systems such as GPS (Global Positioning Satellite System), JTIDS (Joint Tactical Information Distribution System), MACS (Multiple Access Communication System), and other systems. Because of the enormous significance this can hold for NATO system effectiveness, the purpose of this meeting is to treat the issues comprehensively with a view toward enhancing their effective and timely utilization in important NATO systems. Further, since inertial guidance technology has become the core technology for straightforward implementation of guidance and advanced navigation systems, the state-of-the-art in this technology will be determined in this Symposium with particular emphasis on strapdown systems. Additionally, advance on hybrid inertial navigation systems and related filtering continue to be made at a very significant pace, and this technical meeting will include the many important issues in this area.

The Panel will publish an AGARDograph on 'Spacecraft Guidance and Control' which will consider recent developments in spacecraft guidance and control and the state-of-the-art technologies in these areas. A second AGARDograph on 'Advancement in Visualization Techniques' will address the theory, applications and hardware associated with the field of electronic visualizations techniques.

As usual the Panel will sponsor a Lecture Series. The subject is 'Fault Tolerance Design and Redundancy Management Techniques'. The Lecture Series is intended to address the fundamental and theoretical concepts involved in the application of observation techniques, estimation, advanced software fault detection to analytic redundancy for fault tolerant design.

Lastly, the Panel will initiate a new Working Group on 'Functional Integration of Positioning and Guidance and Control Systems'. The Working Group will be aimed at determining the method and criteria for defining a functional structure that can capitalize on the commonality of filtering computation and algorithms to reduce the cost of introducing new positioning systems and establishing a common architecture for future implementation of positioning systems. Emphasis will be placed on providing areas of standardization and structure or architecture that will permit introduction of new systems or technology without reconfiguration of the positioning and guidance and control system.

MEETINGS

30th Panel Meeting/ Symposium (Classified)	— Guidance and Control Aspects of Tactical Air Launched Missiles	5 - 9 May 1980 United States
31st Panel Meeting/ Symposium (Classified)	— Precision Positioning and Inertial Guidance Sensors: Technology and Operational Aspects	13 - 17 October 1980 United Kingdom

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Air Traffic Management – Civil/Military Systems and Technologies Conference Proceedings	January 1980
Air Traffic Management – Civil/Military Systems and Technologies Technical Evaluation Report	January 1980
Guidance and Control Aspects of Tactical Air-Launched Missiles Conference Proceedings	July 1980
Guidance and Control Aspects of Tactical Air-Launched Missiles Technical Evaluation Report	September 1980
Precision Positioning and Inertial Guidance and Control Sensors: Technology and Operational Aspects Conference Proceedings	December 1980
Spacecraft Guidance and Control AGARDograph	April 1981
Advancement in Visualization Techniques AGARDograph	October 1980
Guidance and Control Systems Simulation and Validation Techniques AGARDograph	April 1980

PROPULSION AND ENERGETICS PANEL

Chairman: Dr J. DUNHAM, UK
Deputy Chairman: Prof. E.E. COVERT, US
Executive: To be appointed

PROGRAMME

In 1980 the Propulsion and Energetics Panel will place its main interest in techniques, procedures and facilities for testing of aero-engines. In this field a Symposium is proposed as well as the publication of an AGARDograph. Activities in relation to high-temperature problems and combustion which were treated earlier during 1977 and 1979 will be continued.

In addition, the Panel will pursue its activities in the turbomachinery field and on fuels covering all aspects: complete engines, components and fundamentals.

The Panel programme in 1980 will consist of two Specialists' Meetings (Spring), one Symposium (Fall), three Working Groups (two of which are planned to reach their final phase by the end of 1980) and one AGARDograph. The Panel will also sponsor a Lecture Series.

The Specialists' Meeting on 'Testing and Measurement Techniques in Heat Transfer and Combustion' is considered to be extremely timely for it will effectively complement the recent meetings on 'High-Temperature Problems in Gas Turbine Engines' and on 'Combustor Modelling'. Emphasis will be placed on experimental techniques relevant to both of these areas. Presentations will be selected on recent advances in Temperature Measurement, Flow Measurements, Chemical Measurements, and in general Techniques.

After the presentation of Lecture Series No. 39 on 'Advanced Compressors', and of Lecture Series No. 46 on 'Small Gas Turbine for Helicopters and Small Surface Transport', considerable changes in analytical and experimental methods were observed. There is a large amount of most recent results to be expected and the Specialists' Meeting on 'Centrifugal Compressors' will show the progress and current trends in this field. It will cover four sessions on 'Experimental Investigations of Flows in Impellers and Diffusers', 'Interactions between Impellers and Diffusers', 'Performance and Operation of Advanced Centrifugal Compressors', 'Theoretical Calculations of Flows in Impeller and Diffuser Flows', followed by a Round Table Discussion concentrating on 'Impact of the New Experience of the Design of Advanced Centrifugal Compressors'.

The Symposium to be held in the Fall 1980 on 'Turbine Engine Testing' is aimed at a comprehensive survey of testing requirements, complete engine and component testing, the correlation of engine life prediction and testing program results both for long duration and for limited life engines. The Symposium will comprise eight sessions covering 'Certification Demonstration Testing Requirements', 'Development of Test Requirements', 'Engine Component Testing', 'Complete Powerplant Testing', 'Engine Life Prediction Correlation', 'Development Testing of Gas Turbine for Limited Life Applications', 'Requirements for Future Testing', and will conclude with a Round Table Discussion.

Since the lack of test facilities and test requirements can be a critical constraint for those who are attempting to promote research and engine development on a limited budget and since facilities are almost always a long lead-time item, the assessment of facilities needed for developing future engines and components is certainly important. Although this consideration had led to the Symposium proposal given above, it was felt necessary to consider a complementary activity under the form of an AGARDograph entitled 'Airbreathing Engine Test Facilities' to be published in 1980. This AGARDograph will contain an identification and a review of the present facilities in NATO countries (both government and private) leading to a register or catalogue of test facilities as a handbook for researcher and engine developers. In addition, it should determine the voids of the existing test facilities thus allowing coordinated actions when these voids are filled in.

Working Group 12 on 'Through Flow Calculations in Turbomachines' which will reach its final phase in 1980, will produce its draft report by the end of the year.

Working Group 13 on 'Alternative Jet Engine Fuels' will continue its work and the report is to be expected in 1981.

Working Group 14 on 'Suitable Averaging Techniques in Non-Uniform Internal Flows' has set up a tight schedule of actions leading to a final report by the end of 1980.

The Panel will sponsor a Lecture Series on 'The Application of Design-to-Cost and Life-Cycle-Cost to Aircraft Engines'.

MEETINGS

55th Panel Meeting/ Specialists' Meetings	– Testing and Measurement Techniques in Heat Transfer and Combustion – Centrifugal Compressors	5–9 May 1980 Belgium
56th Panel Meeting/ Symposium	– Turbine Engine Testing	29 September – 3 October 1980 Italy

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Testing and Measurement Techniques in Heat Transfer and Combustion Conference Preprints	March 1980
Testing and Measurement Techniques in Heat Transfer and Combustion Technical Evaluation Report	July 1980
Testing and Measurement Techniques in Heat Transfer and Combustion Conference Proceedings	July 1980
Centrifugal Compressors Conference Preprints	March 1980
Centrifugal Compressors Technical Evaluation Report	July 1980
Centrifugal Compressors Conference Proceedings	July 1980
Turbine Engine Testing Conference Preprints	August 1980
Turbine Engine Testing Technical Evaluation Report	December 1980
Turbine Engine Testing Conference Proceedings	December 1980
Airbreathing Engine Test Facilities AGARDograph	September 1980
Through Flow Calculations in Turbomachines Advisory Report	May 1981
Suitable Averaging Techniques in Non-Uniform Internal Flows Advisory Report	December 1980

STRUCTURES AND MATERIALS PANEL

Chairman: Mr J.B. de JONGE, Netherlands
Deputy Chairman: Dr H.J.G. CARVALHINHOS, Portugal
Executive: Mr J.M.N. WILLIS

PROGRAMME

The Spring 1980 Panel Meeting will include one Specialists' Meeting on the 'Effect of Service Environment on Composite Materials'. This was originally approved as part of the 1979 Programme, but postponement will permit a desired widening of the scope of the Meeting. It will bring together people working on the environmental resistance of composites, for structural use in airframe or engine components, in order to exchange views on test procedures, material characterization, test methods, methods of detecting environmental degradation, understanding the physical and chemical behaviour of products and the level of admissible degradation or defects. The objective is to reduce the range of uncertainty now associated with composites and improve the confidence of users in the weight savings to be obtained.

Two Specialists' Meetings will be included in the Fall 1980 Panel Meeting. The first will be on 'Fatigue of Helicopters' and will deal with fatigue requirements and substantiation procedures, correlation between fatigue testing and service experience, fatigue life versus fail-safe approaches for helicopter structures and dynamic components, and specific aspects of fatigue in new technologies, e.g., composite materials. This meeting is intended to be a major step towards the publication in 1981 of a Handbook on Helicopter Fatigue. The second will be on 'Boundary-Layer Effects on Unsteady Airloads' and will deal with methods of analytical and experimental assessment of the coupling of unsteady boundary layers with unsteady inviscid flow, including determination of detachment points, and their effect upon structural loads.

Work will continue throughout the year on the preparation of a Handbook on Corrosion, the first volume of which will be published as an AGARDograph in the Fall. It is also planned to publish a further Chapter of the Manual on Fatigue.

The Working Group on 'Standard Aeroelastic Configurations' is expected to complete its work, sooner than originally planned, with the publication of the final report early in the year. It is anticipated that a new Working Group will be formed, subject to approval, with the cooperation of the Guidance and Control Panel and the Avionics Panel, on 'Highly Undeformable Structures for Space'. It is intended to study the problems of structural deformation, and its interaction with attitude control, affecting the performance of communications satellites.

The cooperative testing programme on Corrosion Fatigue, which involves research laboratories in both Europe and the USA, will be approaching completion and it is planned to present the results at a Specialists' Meeting in 1981. Another cooperative testing programme will probably be started in the field of high-temperature materials. Several other activities will be publishing the results of their work during the year, as indicated in the list of publications attached, and the Panel will sponsor a Lecture Series on 'Materials Coating Techniques'.

MEETINGS

50th Panel Meeting/	— Effect of Service Environment on Composite Materials	13–18 April 1980
Specialists' Meeting/		Greece
Working Group Sessions		
51st Panel Meeting/	— Fatigue of Helicopters	14–19 September 1980
Specialists' Meeting/	— Boundary-Layer Effects on Unsteady Airloads	France
Working Group Sessions		

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Effect of Service Environment on Composite Materials Conference Proceedings	July 1980

<i>Subject</i>	<i>Projected Publication Date</i>
Fatigue of Helicopters Conference Proceedings	December 1980
Boundary-Layer Effects on Unsteady Airloads Conference Proceedings	December 1980
Manual on Fatigue, Vol.II, Chapter 8 French version English version	August 1980 November 1980
Handbook on Corrosion, Vol.I AGARDograph	December 1980
Standard Aeroelastic Configurations, Phase 2 Advisory Report	February 1980
Factors of Safety Report	August 1980

TECHNICAL INFORMATION PANEL

Chairman: Ir A.S.T.TAN, Netherlands
 Deputy Chairman: Mr H.E.SAUTER, USA
 Executive: Mr E.T.SHARP

PROGRAMME

The Panel will hold a Specialists' Meeting entitled: 'Information Services, their Organization, Control and Use'. At present, there are significant developments underway in Europe in the information science field; the appearance of the Direct Information Access Network for Europe, DIANE, which links together all the information services available through the European data communication network (EURONET) which came into operation in 1979; and the imminent availability of low-cost microprocessor technology. Together with the availability of these new tools, new requirements for information dissemination have to be formulated. Governments have to define new information policies in the form of national action plans and the need for more cooperation and participation in networking has been recognized.

The object of this Specialists' Meeting is to provide a forum in which those who are organizing, controlling and using information services can exchange views on how information problems are to be defined, what actions have to be taken and what problems are likely to be encountered when introducing new systems or technologies. Problems encountered in Portugal in the up-grading of information activities will be specifically addressed.

Work will proceed in 1980 on a further section of the 'Manual of Documentation Practices Applicable to Defence/Aerospace Scientific and Technical Information'. This comprehensive work is being published incrementally over a four-year period and is scheduled for completion in 1981.

MEETINGS

33rd Panel Meeting/ Specialists' Meeting	— Information Services, their Organization, Control, and Use	3-7 November 1980 Portugal
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PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
Information Services, their Organization, Control, and Use Conference Preprints	October 1980
Information Services, their Organization, Control, and Use Conference Proceedings	February 1981
A Manual of Documentation Practices Applicable to Defence/Aerospace Scientific and Technical Information, Volume IV (Sections 10, 11, and 12) AGARDograph	September 1980
Application of Modern Data Processing Techniques to the Production of Dictionaries and Glossaries AGARDograph	October 1980
1980-1982 Supplement to the AGARD Index (1980 Portion)	1982
Guide to On-Line Information Retrieval Equipment Available in Europe Report	August 1980
Multiple Data-Base Searching Report	August 1980

CONSULTANT AND EXCHANGE PROGRAMME

Director, Plans and Programmes: Mr R.A.WILLAUME

Deputy Director, Plans and Programmes: Mr B.HELLOT

INDIVIDUAL CONSULTANTS

The Consultant and Exchange Programme makes available to the NATO Member Nations scientific and technical expertise in the aerospace field. Individual consultants are specifically requested by the National Delegates of the Nations concerned. Individual consultants are also made available to support various AGARD activities. Panels or Panel Members request individual consultants' expertise, visits and lectures by individuals or by teams of experts for carrying out part of their programmes. Panels, Working Groups and the AASC also make use of individual consultants to support specific projects. In 1980 the Consultant Programme will also support two special courses planned by the Aerospace Medical Panel and the Fluid Dynamics Panel. The Aerospace Medical Panel course is organized every two years and the Fluid Dynamics Panel Special Course is held annually and organized jointly with the von Kármán Institute.

<i>Panel</i>	<i>Title of Special Course/Director</i>	<i>Planned Locations</i>
AMP	6th Advanced Operational Aviation Medicine Course on Cardiology in Aircrew/Colonel J.Bande	Brussels, Belgium (March 1980)
FDP	Unsteady Aerodynamics	VKI, Belgium (March 1980)

LECTURE SERIES

Based upon recommendations made by the Panels, the Consultant and Exchange Programme proposes to hold seven Lecture Series during the year 1980. All but two of the Panels will have a Lecture Series.

We have had to limit the number of presentations in order to follow the guidance of the National Delegates Board; however, the same level of effort as in previous years will be maintained.

Taking into account the requests of the various nations, and the proposals made by the Panels, seventeen locations have been selected for the presentation of these seven Lecture Series.

The proposed budget includes the printing of the Lecture Series publications as well as the preparation of the Lecture Series: travel, subsistence allowance and honorarium of participating speakers.

A provisional description of the seven Lecture Series proposed follows:

Lecture Series No.106
(SMP)

MATERIALS COATING TECHNIQUES

March/April 1980
Greece/Turkey/Portugal

In recent years many new coating techniques have been coming into use, or are being developed, for applications where increased protection of engineering materials from the effects of corrosion, erosion and wear, particularly at high temperatures, is needed. This Lecture Series will be introduced with a review of the principles and the present state-of-the-art of applying metallic, ceramic and organic layers for these purposes, with particular emphasis on new techniques such as plasma spray, ion beam, laser etc. The resultant structures and properties of the coating layers and their interaction with the bulk material will be considered.

Lectures will also cover the behaviour of coated parts, as determined by the coating technique and material, and the effects in service of such aspects as corrosion, fatigue, tribology problems, structural stability, etc. Finally, available techniques for the analysis and non-destructive evaluation of the composition, properties, and soundness of the layers will be assessed.

Lecture Series Director: Mr D.Teer, University of Salford, Manchester, UK

**Lecture Series No.107
(PEP)****THE APPLICATION OF DESIGN TO COST AND LIFE
CYCLE COST TO AIRCRAFT ENGINES**May 1980
France/Germany/UK*

Due to limited budgets and the increasingly costly techniques now being used in the production of military aero-engines, consideration must be given to a wider application of such design-to-cost (DTC) and low-life equipment. The continuous advances in technology, the long-lead times now associated with both engine and component development, and the strong interaction of cost and performance, demand that relevant concepts and ideas be selected carefully and that the reasons for their adoption are clearly valid in the context of aero-engines.

Courses and Lectures offered, often at considerable cost, on the commercial market display a confusingly wide range and variety of ideas and AGARD, by its nature, represents a forum in which objective and fair comparisons can be made of the various designs and techniques being used in the NATO countries.

The Lecture Series is proposed to be in two parts. The first comprises consideration of costs and performance in relation to the design phase of aero-engines, with specific reference to relations between manufacturers, government services, and the users. The second deals with the interests of these government services, and the users. The second also deals with the interests of these three groups in relation to DTC and LCC-orientated methodologies and planning.

Lecture Series Director: Mr R.W.Ackerman, State-of-the-Art Seminars, Los Angeles, California, USA

**Lecture Series No.108
(FMP)****AIRCRAFT ASSESSMENT AND ACCEPTANCE TESTING**June 1980
Norway/Greece

This proposed Lecture Series will present information to the "less advanced" NATO Nations so that they will be able to carry out an assessment of the aircraft that they plan to purchase, or conduct acceptance testing of aircraft that have already been purchased. Flight test instrumentation methods will be described that do not require the use of sophisticated ground or airborne instrumentation for data acquisition or large computers for data processing. Flight test techniques will be presented which illustrate ways of acquiring acceptable assessment or acceptance data utilising low-sophistication instrumentation.

Lectures on the first day will cover the following subjects:

- Determination of aircraft weight and balance, and installed static thrust.
- Assessment of takeoff and landing performance.
- Assessment of climb performance.
- Determination of range capabilities.
- Evaluation of flying qualities.

The second day of the Lecture Series will be devoted to the evaluation of aircraft systems and will cover the following topics:

- Engine response.
- Armament system.
- Navigation system.
- Electromagnetic interference.
- Communications system.
- Air combat maneuvering.

Lecture Series Director: M. l'Ing. J.F. Renaudie, Directeur Technique SDT/C, Centre d'Essais en Vol, 91220 Bretigny-sur-Orge, France

**Lecture Series No.109
(GCP)****FAULT TOLERANCE DESIGN AND REDUNDANCY
MANAGEMENT TECHNIQUES**October 1980
UK/Italy/Greece

This Lecture Series is intended to provide the basic theory on concepts involved in the application of advanced software, state estimation, and implementation techniques involved in redundancy management. This Lecture Series will consist of a review which will cover the necessary background and state-of-the-art involved in the application of advancing technologies.

The main topics will include:

- A general introduction and overview of the present state-of-the-art.
- System analysis synthesis.
- Application of state estimation principle.
- Software design.
- Hardware/software interface.
- Test, evaluation/validation.
- Future trends.

Lecture Series Director: Mr T.B.Cunningham, Honeywell Systems and Research Center, Minneapolis, Minnesota, USA

* Jointly sponsored in St Louis.

Lecture Series No.110
(AVP)

**ATMOSPHERIC ELECTRICITY — AIRCRAFT
INTERACTIONS**

June 1980
UK/Germany/USA

The aim of this Lecture Series is to prepare the technological aerospace community for introducing, into the design of future aircraft, proper hardening methods against the adverse effect of static electricity and lightning. It is generally recognized that the vulnerability of an aircraft using extensively non-metallic composite materials for its structures and controlled in a critical way by solid-state digital electronics and microprocessors will be greatly increased if careful precautions are not introduced from the early design state.

Starting from fundamentals related to atmospheric electricity, gas discharges and lightning, and their effect on the aircraft subsystems, especially when new technologies are involved, the Lecture Series presents the new test methodology, the analytical methods, and the protection methods relevant to atmospheric electricity/aircraft interactions.

Lecture Series Director: Mr G.A.Dubro, USAF Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio, USA

Lecture Series No.111
(FDP)

CRYOGENIC WIND TUNNELS

May 1980
Belgium/USA

This Lecture Series is designed for engineers, including those experienced with conventional wind tunnels, wishing to acquire in a concentrated form, the principles and practice of cryogenic wind tunnels. The emphasis will be on the unfamiliar facets of technology which must be applied, and on solutions to special problems which arise from the exploitation of low temperatures. The lectures will cover: background and need for high Reynolds number testing; cryogenic engineering; real gas effects in tunnel design; instrumentation; operating parameters and procedures; and descriptions of cryogenic wind tunnels in operation and under construction.

Lecture Series Director: Professor M.J.Goodyer, The University of Southampton, UK

Lecture Series No.112
(TIP)

PATENTS — AN INFORMATION RESOURCE

October 1980
Germany/Netherlands

Patents, an important part of the total spectrum of scientific and technical information, are often overlooked by the information community and the scientific and technical community. The purpose of this Lecture Series is to make these communities more aware of the importance of patents to the research, development and engineering efforts in each country. The focus of the Lecture Series will be on the methods that are used to index, classify, catalogue and abstract patents. Techniques for storing and searching patent files, including automated systems, will also be discussed. Participants, thus having a better understanding and appreciation of the bibliographic methods that are used for the control of patent literature, will be in a better position to use this valuable information resource.

Lecture Series Director: Mr M.W.Hill, Director, The British Library, Science Reference Library, London, UK

LECTURE SERIES PUBLICATIONS — 1980

<i>Lecture Series No.</i>	<i>Panel</i>	<i>Title</i>	<i>Projected Publication Date</i>
LS 106	SMP	Materials Coating Techniques	March
LS 107	PEP	The Application of Design to Cost and Life Cycle Cost to Aircraft Engines	April
LS 111	FDP	Cryogenic Wind-Tunnels	May
LS 108	FMP	Aircraft Assessment and Acceptance Testing	June
LS 110	AVP	Atmospheric Electricity — Aircraft Interactions	June
LS 109	GCP	Fault Tolerance Design and Redundancy Management Techniques	October
LS 112	TIP	Patents — An Information Resource	October

MILITARY COMMITTEE STUDIES**AEROSPACE APPLICATIONS STUDIES COMMITTEE***Chairman:* Mr R.MARGUET, France**PROJECT 2000 REVIEW BOARD***Chairman:* Mr J.SCOTT-WILSON, UK**MILITARY COMMITTEE STUDIES DIVISION**

<i>Chief:</i>	Colonel E.N.KEMLER, USAF
<i>Deputy for Systems Analysis:</i>	Colonel G.BRON, FAF
<i>Deputy for Research and Development:</i>	Mr J.WILD
<i>Deputy for Project 2000:</i>	Colonel J. de CHAMPEAUX de la BOULAYE, FAF

PROGRAMME

With the completion by the end of 1979 of phase two of the study 'Evaluation of Prospective Major Technological Developments in Aerospace up to the Year 2000 and their Impact on Possible Military Applications' (short title Project 2000), the Military Committee Studies Program will return to the pursuance of Aerospace Applications Studies (AAS). By the direction of the AGARD NDB, the AAS had been held in obedience during the course of Project 2000.

The next AAS, 'Possibilities for Achieving Accurate ASM Delivery from Long Range and from Low and High Altitude' (AAS-12), will begin in January 1980. The topics for additional studies, AAS 13, 14 and 15, will be considered by the AGARD Steering Committee and NDB at their meeting in March 1980. It is anticipated that AAS-13 will start in July 1980 and AAS 14 and 15 in January and July 1981.

Technology Studies are conducted in support of the North Atlantic Military Committee by Ad Hoc Study Groups sponsored by the appropriate Panels. The information and schedules on these studies are included in the Panel programmes.

MEETINGS

AASC Meeting No.17 (Classified)	Define Final Terms of Reference for AAS 13, 14 and 15 Organize Working Group for AAS-13 Initial Review of AAS-12	May 1980 France
AASC Meeting No.18 (Classified)	Review Terms of Reference for New Studies Organize Working Group for AAS-14 Final Review of AAS-12 Initial Review of AAS-13	November 1980 Belgium

PUBLICATIONS

No publications will be produced during 1980.

HEADQUARTERS

OFFICE OF THE DIRECTOR

MEETINGS

48th NATIONAL DELEGATES BOARD MEETING	19-21 March 1980
27th STEERING COMMITTEE MEETING	Paris, France
28th PANEL CHAIRMEN MEETING	
10th NATIONAL COORDINATORS' MEETING	
 16th AGARD ANNUAL MEETING	 24-26 September 1980
49th NATIONAL DELEGATES BOARD MEETING	The Hague, The Netherlands
29th PANEL CHAIRMEN MEETING	

PUBLICATIONS

<i>Subject</i>	<i>Projected Publication Date</i>
National Delegates Board Meeting	
Preprints	March 1980
Bulletin 80/2	July 1980
Director's Annual Report to North Atlantic Military Committee 1979	March 1980
AGARD Highlights 80/2	Fall 1980
81/1	Spring 1981
Calendar of Selected Aeronautical and Space Meetings	June 1980 and December 1980
Revised AGARD History	Spring 1980

III - BUDGET SUMMARY

1980 TECHNICAL PROGRAMME

(IN FRENCH FRANCS)

Panels	1978 <i>Commitments</i>	1979 <i>MBC Approved</i>	1980 <i>Proposed</i>
AMP	232,000	249,000	328,000
AVP	151,000	177,000	144,000
FPP	161,000	139,000	100,000
FMP	284,000	181,000	195,000
FDP	322,000	245,000	255,000
GCP	98,000	230,000	257,000
PEP	208,000	263,000	260,000
SMP	287,000	323,000	305,000
TIP	70,000	75,000	134,000
SUB-TOTAL - PANELS	1,813,000	1,882,000	1,978,000
INDIVIDUAL CONSULTANTS	347,000	365,000	355,000
LECTURE SERIES	620,000	763,000	765,000
SUPPORT TO NATIONS	—	—	60,000
MILITARY COMMITTEE STUDIES	116,000	—	60,000 ⁽¹⁾
HEADQUARTERS	76,000	60,000	68,000
OTHER COSTS (Certificates, Layout Sheets, Forms, Meeting Announcements, Distribution, Internal Reproduction, Technical Translation, etc.)	261,000	290,000	296,000
ADJUSTMENT IN TECHNICAL PROGRAMME DUE TO THE CHANGE IN THE RATE OF EXCHANGE	—	—	188,600
TOTAL - NORMAL AGARD TECHNICAL PROGRAMME	3,218,000	3,360,000	3,770,600
MAD	68,000	119,400	152,000 ⁽²⁾
P-2000 - PHASE I	—	—	—
P-2000 - PHASE II	182,000	488,000	—
TOTAL-SPECIAL TASKS	250,000	607,400	152,000
GRAND TOTAL - INCLUDING SPECIAL TASKS	3,468,000	3,967,400	3,922,600 ⁽³⁾

(1) Renewal of AASC.

(2) Additional funds required to complete MAD.

(3) Average price for the full year.

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<i>Activity</i>	<i>Reports</i>	<i>Advisory Reports</i>	<i>AGARDographs</i>	<i>Conference Preprints</i>	<i>Conference Proceedings</i>	<i>Misc.</i>	<i>Total</i>
AMP	1	1	4	4	4	1	15
AVP	—	—	—	2	2	—	4
EPP	—	—	—	2	2	—	4
FMP	—	2	3	—	2	—	7
FDP	1	2	5	2	2	—	12
GCP	—	2	3	—	3	—	8
PEP	—	6	1	3	2	—	12
SMP	1	1	1	—	3	2	8
TIP	2	—	2	1	1	1	7
DPP	—	—	—	—	—	7	7
MCS	—	—	—	—	—	—	—
HQS	—	—	—	—	—	8	8
TOTALS	5	14	19	14	21	18	92

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4

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